

Acceptability to Patients of a Home Hospital

Lynda C. Burton, ScD,* Bruce Leff, MD,[†] Michael Harper, MD,[†] Ipsita Ghoshtagore, BS,*
Donald A. Steinwachs, PhD,* William B. Greenough, III, MD,[†] and John R. Burton, MD[†]

OBJECTIVE: To examine the acceptability to older patients of receiving care in the home for acute medical conditions that require hospital level care by current standards.

DESIGN: Interviews with patients during hospitalization regarding their views of a hypothetical "home hospital."

PARTICIPANTS: Patients (n = 87) admitted to a community-based academic medical center with a primary diagnosis of pneumonia, congestive heart failure, or chronic obstructive airway disease, their nurses (n = 111), and resident physicians (67).

MEASUREMENTS: A questionnaire was developed to measure several domains of acceptability and expectations for care.

RESULTS: A majority of patients agreed that treatment in a home hospital would be more comfortable compared with treatment in a hospital (78.5%), would be less likely to result in an infection (62.5%), and would not be a burden to their family (71.8%). There was less certainty that medical care at home can be as good as in the hospital (56.9%). Nearly three-quarters (72.3%) of patients would choose home hospital if it were available.

CONCLUSION: Patients may be ready to accept home hospital as an alternative for acute care. The acceptability of home hospital to acutely ill older patients is a critical factor in the development of this alternative for care and has the potential for improving satisfaction with care, reducing complications, hastening return to function, and, possibly, of lowering costs of care. *J Am Geriatr Soc* 46:605-609, 1998.

Dramatic changes in the healthcare system are having an important effect on the mission of the acute care hospital. The acute hospital is being used principally for its advanced technology, whereas lengths of stay in general medical units have decreased.^{1,2} This movement is motivated primarily by cost containment and is facilitated by the increased availability of home health services to deliver effective

care. Increasing recognition that hospitals can be a stressful environment for frail older people, placing them at increased risk of iatrogenic illness and dependency, also motivates limiting hospital stays.^{3,4} These changes coincide with the advent of consumerism in medicine, empowering patients and their families to become involved not only in their personal health behavior but in making choices about the venue of care.

A home hospital, as defined in this study, would treat older patients with selected acute medical conditions in their home, achieve a standard of care comparable to care in the hospital setting while avoiding hospital-associated complications, and deliver physician, nursing, and diagnostic and therapeutic modalities to older persons in a potentially more acceptable model. The expected outcomes are fewer complications, quicker return of function, higher patient satisfaction, and equal or lower costs. As envisioned, a home hospital could become an established alternative for care offered by full service medical centers.

A pilot Home Hospital program is currently being tested for feasibility by geriatricians at the Johns Hopkins Bayview Medical Center, a community-based academic medical center. Its design and implementation grew out of the preliminary work described here. The threshold for eligibility for this home hospital is that a physician in the emergency room or ambulatory site has determined that a hospital admission is necessary. Implicit in this is the requirement for physician surveillance, skilled nursing care, and, possibly, the need for advanced diagnostic tests or the provision of certain technologies such as intravenous medicines or oxygen therapy. Eligibility criteria for home hospital for patients with pneumonia, exacerbations of congestive heart failure, or chronic obstructive pulmonary disease have been described.⁵ As the medical feasibility of this program is examined, a major concern is whether such an acute care model in the home would be acceptable to patients and their families.

This paper examines the acceptability to older patients of receiving care in the home for acute medical conditions that require hospital-level care by current standards and focuses on defining and measuring acceptability. Data on acceptability of a theoretical "home hospital" versus the hospital care they were receiving are described, as are patients' expectations for the level of skilled nursing and aide services in home hospital. In addition, data are presented in regard to the opinions of the hospital nurse providing the most care to the patient, and those of the resident physician, as to whether home hospital would have been a safe and feasible option for a patient.

From the *Health Services Research and Development Center, Department of Health Policy and Management, Johns Hopkins University School of Public Health and †Division of Geriatric Medicine and Gerontology, The Johns Hopkins Bayview Medical Center, Baltimore, Maryland.

Supported by Grant no. 94032-G from The John A. Hartford Foundation.

Presented as a poster at the Annual Meeting of the American Geriatrics Society, Chicago, Illinois, 1996.

Address correspondence to Lynda C. Burton, ScD, Health Services Research and Development Center, 624 N. Broadway, Baltimore, MD 21205.

METHODS

Population

The Home Hospital Acceptability Study was part of a larger prospective study to validate patient selection criteria for admission to a home hospital.⁵ The population was 143 patients (157 consecutive admissions between January and April 1995) admitted to nonintensive care medical beds at the Johns Hopkins Bayview Medical Center for community-acquired pneumonia or exacerbations of congestive heart failure or chronic obstructive airway disease. Patient eligibility for the hypothetical home hospital was based on specific clinical criteria at the time the decision to admit to hospital was made. The patient's course in hospital was monitored for clinical complications and to document procedures that would have been difficult or impractical to do in the home.

Patients were asked to participate in the Acceptability Study following consent procedures approved by the hospital institutional research board. Eighty-seven of the 157 admissions (61%) were enrolled and interviewed in the hospital by either a study investigator (L.B.) or a research assistant within 72 hours of admission. In 11 cases, a family member either participated in the interview with the patient or was the sole respondent as a proxy for the patient. Of those not enrolled, 46 were discharged before being approached to participate, and no attempt was made to interview them after discharge because we believed that responses obtained from a person discharged could differ from responses from a person still hospitalized. Nine patients refused to participate, and 15 could not be located. Comparison of those enrolled and those not enrolled showed those not enrolled had a significantly shorter length of stay (3.9 days vs 5.7 days). There were no differences in age, living arrangement, health status at admission (by percent with an acute comorbid condition or eligibility for home hospital), or hospital course (percent with an emergency clinical situation or who were transferred to an intensive care unit).

Definition and Measurement of Acceptability

The domains that were included in the definition and measurement of acceptability were based on the experience

of the authors (B.L., J.B., W.G.) with a physician house call program for homebound older patients.⁶ No directly relevant examples were found in the literature on patient interest in regard to acceptance of acute care in the home, but the Pneumonia Patient Outcome Research Team (PORT) described a strong preference for home versus hospital care among low-risk patients with community-acquired pneumonia, using pneumonia scenarios.⁷ Several domains were believed to be important in conceptualizing acceptability of home hospital: perceived comfort, perceived safety, belief that in hospital one is more apt to get an infection, and/or concern that it would be intrusive to have nurses and doctors coming to the home. These domains were operationalized with the questions listed in Table 1. A total of at least three positive responses (strongly agreed or agreed) to the four questions was used as a composite measure of acceptability. A second measure of acceptance used in the analysis was a single question regarding preference: "If I had the choice of being treated at home rather than in the hospital, and my doctor had agreed, I would have chosen to be treated at home." This question was coded as a dichotomous variable with those who strongly agreed or agreed scored as "accepted."

The description of Home Hospital was read to the patient and/or family member proxy and stated that a home hospital program was being developed to treat patients with their condition at home instead of in the hospital. It was explained that this treatment option would give comparable medications, treatment, and nurse and doctor care as received in the hospital, but it would take place in the home. Treatment at home might involve some additional burdens on the family member, but the intent was to provide all of the medical care needed by the patient. This would involve a nurse being with the patient for the first 24 hours and then until the physician felt the patient was stable. In addition, a doctor would visit the patient in the home at least daily until discharge from Home Hospital to check the patient's condition, provide treatment and medications, and remain available at all times for an emergency. In order to remove cost of care from consideration, the respondent was told to assume

Table 1. Acceptability of Home Hospital to Patient

	Percent Responses at Each Level*				
	5	4	3	2	1
Questions in composite measure					
1. I would be more comfortable being treated at home rather than in the hospital	33.3	45.2	3.6	16.7	1.2
2. At home, I would not be as likely to get a cold or infection from someone else	13.7	48.8	16.4	26.0	0
3. Medical care at home can be as good as medical care in the hospital for people as sick as I am now [†]	0	56.9	8.3	31.9	2.8
4. It would not bother me (or my family) to have nurses and doctors coming into my home [†]	3.5	75.3	2.4	17.6	1.2
Single measure of acceptance					
If I had the choice of being treated at home rather than in the hospital, I would have chosen to be treated at home	28.9	43.4	2.4	21.7	3.6

* Level of acceptance: strongly agree = 5, agree = 4, indifferent = 3, disagree = 2, strongly disagree = 1.

[†] Questions were recoded so that 5 = strongly acceptable and 1 = strongly unacceptable. In 11 cases, a family member either participated in the interview with the patient or was the sole respondent as a proxy for the patient.

that costs of care in the home would be covered by Medicare, as they are if the patient was in the hospital.

Several important elements that may confound a decision to accept home hospital were measured: the patients' functional status before the onset of the acute condition, their living arrangements, perception of the potential burden of care on a family member or friend, age, race, gender, severity of condition for which they were hospitalized, and prior experience with a home health agency. Functional status was measured by counting the number of ADL impairments. Living arrangement was coded to show whether the patient lived alone or with others; if with others, with a spouse, children, or others. Perceived burden on family was measured with the question, "It would bother me (or my family) to have nurses and doctors coming into my home." The indicator of severity of condition, based on other work by the authors,⁵ was a dichotomous variable that predicts whether the patient is more likely to have an acute comorbid condition at admission, longer length of stay, experience an emergency clinical situation, or transfer to the intensive care unit.

Definition and Measurement of Expectations of Patients for a Home Hospital Program

A key factor in acceptability was hypothesized to be the amount of nursing coverage that would be provided in the home during the first 24 hours and in subsequent days when the condition may remain acute. The Home Hospital scenario stated that skilled level nursing services would be performed by fully trained formal caregivers, RNs or home health aides. However, there might be additional roles that a family member or other potential informal caregiver would have to perform, which could have a substantial impact on the program's acceptability. Patients' expectations of formal help were measured for a set of tasks taken for granted as fully covered in a hospital, including provision of special food, changing the bed, shopping for food, giving pills, and doing light housework. Responses were coded as not expecting help if the respondent stated that either a person living with them or a family member or friend who would come in would do the task rather than expecting a nurse or nurses' aide to do it.

Measurement of Nurse and Resident Physician Acceptability of Home Hospital

The nurse and resident house staff physician assigned to the patient during the hospital stay may provide valuable judgments as to the appropriateness of Home Hospital for a patient. The objectives, as well as operationalization of the theoretical home hospital, were explained to both nurses and physicians. Reflecting on the patient's medical course during the hospitalization, nurses were asked whether Home Hospital would have been a feasible and safe option for treatment. Nurses' responses were obtained for 111 admissions. Resident physicians were asked a single question: "Based on this patient's condition at the time of admission, would you have recommended community-based home hospital as a feasible and safe option for treatment?" Sixty-seven physician responses were obtained.

RESULTS

Table 1 shows the questions related to acceptability of home hospital and the distribution of responses. The majority (71%) either strongly agreed or agreed with at least three

of the four questions in the composite score; 72% strongly agreed or agreed that they would have chosen a home hospitalization if available. Two of the questions were apparently difficult for patients to answer, with many "don't know" responses: one, regarding the chances of iatrogenic infection, and two, whether medical care at home can be as good as in hospital. The question regarding iatrogenic infection also had the largest number of "indifferent" responses.

Table 2 displays patient characteristics and acceptability of home hospital by these characteristics. The first column shows the distribution of patient characteristics; the second column, the percentage that agreed with at least three of the four questions in the composite measure, by patient characteristics; the third, the percentage who would have chosen home hospital, if available, by patient characteristics. Socio-demographics, previous experience having a nurse come to the home, functional status before the onset of the acute condition, and severity at admission were not associated with either measure. Living with children and having three or more persons living in the household were mildly negatively associated with the composite measure of acceptance.

Patient respondents and nurses were asked to estimate the time they would want to have or believed it important to have a nurse or aide in the home. For the first 24 hours of admission, 62.1% of patients and 39.6% of nurses said "all" or "most" of the time. After the first day, 43.1% of patients and 22.1% of nurses said care was needed "all" or "most" of the time.

The majority of patients believed that a family member or friend, rather than a formal caregiver such as a nurse or nurse's aide, could accomplish personal care tasks such as changing the bed (74.6%), washing bed linens (76.5%), preparing meals (79.3%), giving medications (79.3%), shopping for food (82.9%), or doing light housekeeping (85.2%),

Seventy percent of both nurses and resident physicians would have found home hospital "feasible and safe" for the patient for whom they provided care.

DISCUSSION

This study explores issues relevant to the acceptability of a hypothetical home hospital model of care for acute medical illnesses for older persons. The domains considered include patient preferences for site of medical care and concerns regarding quality of care, comfort and personal care, and caregiver burden. The data suggest a high level of patient acceptance for care in a hypothetical home hospital, a varying level of perceived need for constant attention from a nurse during a home hospital stay, and a relatively low expectation among patients for formal help with personal care.

There is evidence that older patients and their families prefer to receive long-term care at home rather than in an institutional setting.⁸ Post-acute home health care is now used widely and has a high level of patient acceptance.⁹ Several models of home hospital exist that serve less acutely ill patients and these report high levels of patient satisfaction.^{10,11} But little is known about patient and family preferences for acute care, largely because the acute hospital is the accepted standard in developed countries for treatment and at present other acceptable options for care do not exist. Clinicians caring for older patients report that some of their patients refuse hospitalization for acute conditions,¹² but the extent of refusal, medical and support services the older person receives in lieu of hospitalization, and the conse-

Table 2. Patient Characteristics and Acceptability of Home Hospital

	% in Study Population	% Acceptance of Home Hospital by Two Measures	
		Composite Measure of Acceptance	Would Have Chosen if Available
Age			
<75	56.3	68.2	71.7
≥75	43.7	74.2	73.0
Gender			
Male	54.0	70.5	73.3
Female	46.0	71.0	71.1
Living arrangement			
Alone	31.0	84.2	76.9
With others	69.0	66.1	70.2
If with others			
Lives with spouse: yes	55.0	68.8	62.5
Lives with spouse: no	45.0	62.5	80.0
Lives with children			
Yes	46.7	50.0	80.0
No	53.3	79.3*	62.5
3 or more in household			
Yes	33.7	57.1	81.5
No	66.3	80.4*	67.9
Ever had nurse come to home			
Yes	52.6	75.7	76.9
No	47.3	60.0	67.7
Severity at admission			
Moderate	37.9	66.7	75.0
High	62.1	74.3	70.6
ADL: 1 or more impairments:			
Yes	45.3	81.8	76.3
No	54.7	61.9	68.2

N = 87

Composite measure of acceptance: comfort + avoidance of iatrogenic infection + belief that care at home can be as good as hospital + not being disrupted by having nurse/doctor in the home.

Single measure: would have chosen Home Hospital if available.

* Chi square statistic, $p < .05$, for comparison of "yes" to "no" responses.

quences of not being hospitalized are not well known. Presumably, a home hospital would be welcomed by these individuals and their physicians.

Patient and family preferences for alternative modes of care are understudied, in part because of the current acceptance of hospitalization as the standard of care for acute medical conditions. However, current cost pressures have forced re-examination of the use of traditional hospital beds, leading to development of subacute units, step-down units, and shortened stays. Some rehospitalizations are being avoided altogether with the use of home health agencies and physician assistants making home visits.¹³ Home hospital represents a different option by putting in place a physician-led team who can treat, at home, an older person on the cusp of admission to the acute hospital.

There are several limitations in interpreting these data. First, responses reflect interest in a hypothetical intervention expressed after subjects had begun treatment in the hospital and had been clinically stabilized and, therefore, may not represent willingness to enroll in an actual program at the time of acute illness. Second, more needs to be known about the health status and capability of the potential family caregiver and their willingness to carry out personal care that may

be required. Despite explaining carefully the proposed intervention to study participants, the hypothesized program may not have been understood. This stems in part from semantic difficulties in explaining and understanding that home hospital is different from home care, that home hospital is meant to be an appropriate substitute for acute hospital care, and, perhaps, in overcoming patient bias that the hospital represents the best care. This is reflected by the fact that no subjects *strongly* agreed that medical care at home can be as good as medical care in the hospital, whereas 57% gave the more tentative "agree" response. In contrast, nearly 30% of patients strongly agreed that they would have chosen to be treated at home, and an overwhelming 78% strongly agreed or agreed that they would be more comfortable being treated at home. Perhaps the willingness to be treated at home despite some hesitation about whether such care can meet hospital standards reflects a willingness among older persons with acute medical illness to trade perceived quality for familiar surroundings and convenience.

Acceptability for acute medical care in the home discussed in this paper is specific to the proposed Home Hospital at Johns Hopkins, and this may limit the generalizability of the conclusions. However, the responses of patients will be of

value to those developing similar programs, or encouragement to provider groups and managed care organizations to consider the acceptance of their older patients of a new service, which can potentially result in better health outcomes at reduced or neutral cost.

Coupled with the growing technical capability of home health agencies¹⁴ and an increasing awareness of problems associated with hospitalizing older patients,^{3,4} the home hospital may, in the foreseeable future, become the treatment of choice. It will be important to assess the acceptability of a home hospital to physicians as well as to patients. Our findings indicate that physicians-in-training believe many of their older patients could be treated successfully in this alternative setting. Physician recognition of the potential benefits of treating older patients in their homes, and the level of comfort resulting from providing acute care in this new setting, may be critical factors in widespread implementation. Home hospital will be an important addition to the relatively small but growing number of existing physician home visiting programs.^{8,10,11,15,16}

A prospective feasibility study of Home Hospital, based on the hypothesized model described here, is currently being carried out and will provide empirical data on patient acceptance of this care model. A multisite evaluation of the process and outcomes of acute care in the home will be necessary to measure rigorously the acceptability among patients and their families of this new option for acute care.

REFERENCES

1. Stoeckle JD. The citadel cannot hold: Technologies go outside the hospital, patients and doctors too. *Milbank Q* 1995;73:3-17.
2. Shortell SM, Gillies RR, Devers KJ. Reinventing the American hospital. *Milbank Q* 1995;73:131-160.
3. Brennan TA, Leape LL, Laird NM. Incidence of adverse events and negligence in hospitalized patients. *N Engl J Med* 1991;324:370-376.
4. Creditor MC. Hazards of hospitalization of the elderly. *Ann Intern Med* 1993;118:219-223.
5. Leff BA, Burton LC, Bynum JW et al. Prospective evaluation of clinical criteria to select older persons with acute medical illness for care in a hypothetical home hospital. *J Am Geriatr Soc* 1997;45:1066-1073.
6. Finucane TE, Fox-Whalen S, Burton JR. The Elder Housecall Program at Johns Hopkins. *J Long-Term Home Health Care* 1994;13:29-36.
7. Coley CM, Li YH, Medsger AR et al. Preferences for home vs hospital care among low-risk patients with community-acquired pneumonia. *Arch Intern Med* 1996;156:1565-1571.
8. Steel K. Physician-directed long-term home health care for the elderly: A century long experience. *J Am Geriatr Soc* 1987;35:264-268.
9. Martin F, Oyewole A, Moloney A. A randomized controlled trial of a high support hospital discharge team for elderly people. *Age Aging* 1993;23:228-234.
10. Stessman J, Ginsberg G, Hammerman-Rozenberg R et al. Decreased hospital utilization by older adults attributable to a home hospitalization program. *J Am Geriatr Soc* 1996;44:591-598.
11. Ferguson G. Designed to serve: The New Brunswick Extra-Mural Hospital. *J Ambulatory Care Manage* 1993;16:40-50.
12. Barry PP. Why elderly patients refuse hospitalization. *J Am Geriatr Soc* 1988;36:419-424.
13. Rich MW, Beckham V, Wittenberg C et al. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. *N Engl J Med* 1995;333:1190-1195.
14. Stoeckle JD. Primary care and diagnostic testing outside the hospital. *Int J Technol Assess Health Care* 1989;5:21-30.
15. Burton JR. The house call: An important service for the frail elderly. *J Am Geriatr Soc* 1985;33:291-293.
16. Leff B, Burton JR. Acute medical care in the home. *J Am Geriatr Soc* 1996;44:603-605.